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KEYS AND CHARTS FOR CALIFORNIA SPECIES OF ATRIPLEX

by

Beryl O. Schreiber
WPA Supervising Botanist[1/]

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In California the genus Atriplex is characterized by many species which form a large part of the flora of alkaline areas of desert, interior, and sea-coast associations. Although several keys are available, they are too long and technical for the field workers. An attempt has been made to construct a usable field key.

The key is based primarily on duration of the plant (annual or perennial), distribution, and vegetative characters, but in many cases it was necessary to resort to the fruiting bracts for the separation of species or subspecies. The accompanying charts present descriptions of each species in a manner in which they can be compared. The drawings which illustrate the leaf characters and bracts of each species and subspecies supplement the descriptions given in the charts, and the variations from the typical leaf or bract for each species have been included. It is to be noted that the fruiting bracts are usually long-persistent, but, when not present, remnants of these may be found by digging in the litter at the base of the plant. All of the distinguishing characters used in the key have been underlined in the charts in order to emphasize them.

The keys, charts, and drawings are based primarily on H. M. Hall and F. E. Clements, "The North American Species of Artemisia, Chrysothamnus, and Atriplex," (Carnegie Inst. Wash. Publ. 326: 235-346, 1923). References were also made to W. L. Jepson, "Manual of the Flowering Plants of California," and P. A. Munz, "Manual of Southern California Botany." These have all been supplemented by a critical study of annotated specimens available in the U. C. Herbarium and specimens collected by the Vegetation Type Map Project.

KEY TO ATRIPLEX SPECIES

A. Herbaceous plants.
  B. Annual herbs.
    C. Leaves green.
      D. Leaves cordate or hastate at base.
        E. Plant spreading, erect, decumbent or prostrate; leaves drying green; saline and salt marshes; western North America.....1. A. patula
        E'. Plant erect, compact; leaves drying chartaceous; interior, not coastal.....2. A. phyllostegia
      D'. Leaves all narrowed at base, not cordate.....3. A. bracteosa
    C'. Leaves gray-scurfy.
      D. Coastal, Los Angeles Co., south to Lower California.....4. A. microcarpa
      D'. Not coastal, interior valleys of California and elsewhere.
        E. Leaves cordate to truncate or subhastate at base.
          F. Leaves cordate at base, small, lower leaves sometimes to 1.5 cm., Sacramento and San Joaquin Valleys.....5. A. cordulata
          F'. Leaves truncate or subhastate, usually over 1 cm. to 3 or 4 cm.; northeastern California, Mono Co. and Great Basin.....6. A. truncata
        E'. Leaves not cordate to truncate, subhastate only occasionally in A. argentea; usually rounded or cuneate at base.
          F. Leaves ovate to deltoid, broad and occasionally subhastate at base, mostly 1-4 cm. wide, 2-5 cm. long.....7. A. argentea
          F'. Leaves narrowly ovate, to oblanceolate to elliptic, mostly not over 3 cm. wide and less than 1 cm. wide, except in A. rosea.
            G. Most of the leaves coarsely toothed, bracts becoming hard and tough; introduced.8. A. rosea
            G'. Leaves entire; bracts not becoming hard and tough; not introduced.
              H. Bracts flat, exactly orbicular, evenly toothed all the way around.....9. A. elegans
              H'. Bracts not orbicular.
                I. Leaves sessile or subsessile, ovate to lanceolate.
                  J. Erect, rigid, slender herb; only in southern San Joaquin Valley.....10. A. tularensis
                  J'. Erect, but seeming prostrate, widely branched; upper Sacramento Valley to southern border of California; east to Mohave Desert.....11. A. parishii
                I'. Most of leaves except the upper petioled, elliptic.....12. A. coronata
  B'. Perennial herbs.
    C. Coastal species.
      D. Bracts separate nearly to the base, entire.....13. A. californica
      D'. Bracts united to middle or above, entire or denticulate.
        E. Bracts 2.5-3 mm. long, usually with 3 raised nerves.....14. A. coulteri
        E'. Bracts 5-8 mm. long, not nerved.
          F. Bracts spongy, not compressed, completely united except at apex.....15. A. leucophylla
          F'. Bracts compressed, not spongy, united to middle.....16. A. decumbens
    C'. Introduced or valley species.
      D. Leaves remotely repand-dentate or entire; introduced species.
        E. Bracts convex and fleshy, acute at apex, united below middle, 3-5-nerved, turning red, common.....17. A. semibaccata
        E'. Bracts loose and spongy, flattened at summit, united except at tips, not nerved nor turning red; incompletely naturalized.....18. A. halimoides
      D'. Leaves entire; Sacramento and San Joaquin Valleys.....19. A. fruticulosa
A'. Shrubby or subshrubby species.
  B. Bracts never conspicuously 4-winged.
    C. Plants not spiny.
      D. Leaves coarsely and saliently toothed.....20. A. hymenelytra
      D'. Leaves not coarsely and saliently toothed.
        E. Leaves linear-spatulate or falcate; northeastern California.....21. A. nuttallii
        E'. Leaves not linear-spatulate.
          F. Leaves large, 1-5 cm. long, 0.5-5 cm. wide, deltoid or ovate; bracts orbicular, margins entire or crenulate.....22. A. lentiformis
          F'. Leaves small, 0.3-1.5 cm. long, 0.2-0.4 cm. wide, longer only on sterile shoots; elliptic-oblong or spatulate, bracts cuneate-orbicular, margins shallowly to deeply laciniate-dentate.....23. A. polycarpa
    C'. Plants spiny.
      D. Leaves cordate or subcordate at base.....24. A. parryi
      D'. Leaves not cordate.
        E. Tall shrub, 3½-10 ft. high; bracts 2-5 or 7 mm. long.....22. A. lentiformis
        E'. Low shrubs, 8 in. to 3 ft. high.
          F. Bracts with orbicular or oblong wings developed above the body; San Joaquin Valley to western Mohave Desert.....25. A. spinifera
          F'. Bracts orbicular or elliptic, united over the seed but free margins not winglike; eastern California.....26. A. confertifolia
  B'. Bracts conspicuously 4-winged; leaves usually linear-spatulate.....27. A. canescens

CHART DESCRIPTIONS OF ATRIPLEX SPECIES

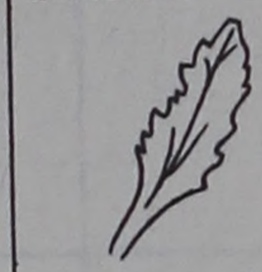
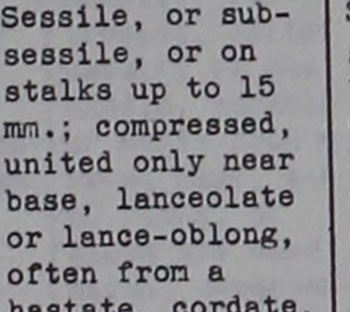
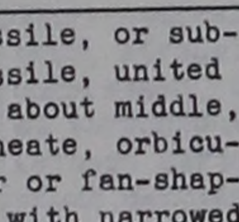
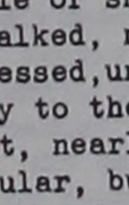
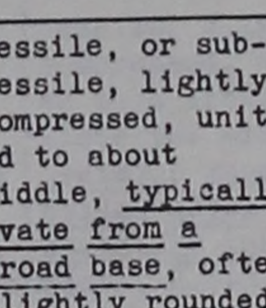
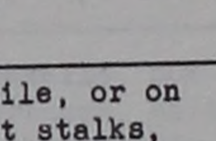
	1. A. patula	2. A. phyllostegia	3. A. bracteosa	4. A. microcarpa	5. A. cordulata	6. A. truncata
HABIT	Erect, decumbent or prostrate annual herb.	Erect, annual herb, bushy plant.	Erect or decumbent annual herb, forms dense, tangled mats.	Prostrate or procumbent annual herb, forms tangled masses, ultimate branches erect.	Erect, rigid, annual herb.	Erect, annual herb, ascending branches or unbranched.
HEIGHT	8"-40", sometimes reduced.	4"-16" high.	1½'-3' across.	8"-3' across, 4"-16" high.	4"-20" high.	8"-3' high.
BRANCHES	Slender, or stout, rigid, becoming more or less grooved.	Slender, terete, faintly striate, pubescent, or glabrate.	Slender, erect, obtusely angled, grooved, sparsely scurfy to glabrate, pale.	Tough, flexuous, obtusely angled or terete, soon glabrate.	Heavy, rigid, not angled, glabrate in age.	Slender, angled, herbage glabrate, bark dull white or reddish.
LEAVES	Opposite below, alternate above, or all opposite; petioled or sessile, subdeltoid-lanceolate or ovate, vary from triangular-hastate to linear, cordate or hastate at base, margins entire or dentate, green and glabrate at maturity. (See illustrations under subspecies, page 7.)	All alternate except 2 lower pair, petioled or sessile, rhombic-triangular or hastate to broadly ovate, or lanceolate, terminal portion elongate-lanceolate, and acute or acuminate, cordate or hastate at base, 1-3 cm. long, 1-3 cm. wide, thick and succulent, glabrate and green, drying chartaceous.	Alternate, numerous, sessile or subsessile, lanceolate, narrowly ovate to elliptic, all narrowed at base, acute or acuminate at apex, 2-4 cm. long, 0.4-1.5 cm. wide, or longer on sterile shoots, sparingly dentate, or entire, thin, scurfy when young, green, 1-nerved. 	Alternate or a few lower opposite, numerous, sessile or lower short-petioled, oblanceolate or spatulate-elliptic, narrowed at base, acute or obtuse at apex, often mucronulate, 0.5-2 cm. long, 0.3-0.6 cm. wide, entire, thin, gray-scurfy.	Alternate except lower, closely sessile, ovate, all cordate at base except lowest, acute at apex, 0.5-1.5 cm. long, 0.3-1 cm. wide, entire, thick, tomentose.	Alternate or lower opposite, mostly sessile, deltoid or triangular-ovate or round-ovate, rarely oval, truncate or subhastate at base, rarely rounded, acute or obtuse at apex, 1-3 or 4 cm. long, 0.8-2 cm. wide, entire or undulate, thin, gray-scurfy.
BRACTS	Sessile or stalked, not much compressed, united only near base, bracts hastate or cuneate at base, deltoid to linear, 3-12 mm. long and as wide, herbaceous, broad free margins entire or sparsely denticulate, faces smooth or muricate, or with clustered tubercles, often veined.	Sessile, or subsessile, or on stalks up to 15 mm.; compressed, united only near base, lanceolate or lance-oblong, often from a hastate, cordate, or winged base, free tips attenuate, and widely separated, 5-20 mm. long, 3-5 mm. wide at base, entire or laciniate sides, smooth except for 3 ribs and cross veinlets, or appendaged, some to 4 mm. long. 	Sessile, or subsessile, united to about middle, cuneate, orbicular or fan-shaped with narrowed summit, 2-2.5, rarely 3 mm., long, 2-3 mm. wide; margins greenish and acutely dentate above middle; faces tuberculate, or smooth; 1-nerved or with faint secondary nerves, scarcely scurfy. 	Sessile or shortly stalked, not compressed, united nearly to the summit, nearly orbicular, but with narrowed base and broad summit, obtuse, 1-2 mm. long, 1-2.2 mm. broad, entire, except for 1 to several minute teeth across the summit, faces smooth or with a few minute tubercles, 1-nerved, not obviously reticulated. 	Sessile, or subsessile, lightly compressed, united to about middle, typically ovate from a broad base, often slightly rounded to a short stalk, usually broadest below, or free margins developed. green and acutely dentate; faces smooth, densely scurfy, or with only a few short protuberances 4-5 mm. long, 4-5 mm. broad. 	Sessile, or on short stalks, scarcely compressed, united to summit, broadly cuneate, truncate at summit, 2-3 mm. long, 2-3 mm. broad, 2-4 minute teeth on green margins; faces smooth or rarely with 1-2 minute tubercles, the scurf obscure and the veins and reticulations prominent. 
SEEDS	1-3 mm., dark brown or black.	1.2 mm. long, brown.	1-1.3 mm. long, brown.	0.8 mm. long, light brown.	1.5-1.8 mm. long, deep reddish brown, or nearly black, shining.	1-1.5 mm. long, light brown to dark amber, shining.
DISTRIBUTION	Saline and salt marshes throughout North America.	W. Utah, Nevada and SE. Oregon; E. California, N. to San Joaquin Valley.	Alkaline valleys of California from Sacramento south to Lower California, rare east of Sierra, also in W. central Nevada.	Near the coast from Los Angeles Co., California to middle western Lower California.	California: Sacramento and San Joaquin Valleys.	Great Basin in eastern California and Mono Co.

CHART DESCRIPTIONS OF ATRIPLEX SPECIES (CONT.)

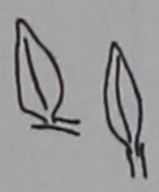
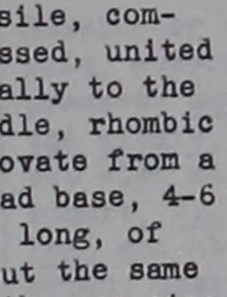
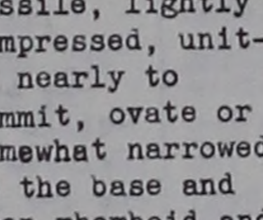
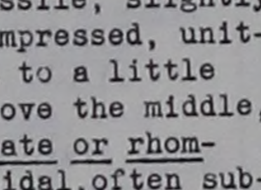
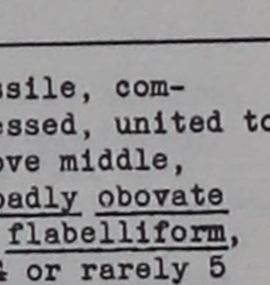
	7. A. argentea	8. A. rosea	9. A. elegans	10. A. tularensis	11. A. parishii	12. A. coronata
HABIT	Erect, annual herb, freely branched from base and globoid in outline.	Erect, annual herb, branched from base, forms rounded bushy plant.	Erect or subdecumbent annual herb, branched from base, commonly small.	Erect, rigid, but slender, annual herb.	Erect, but often seeming prostrate, rigid, annual herb, widely branched.	Erect, spreading, annual herb, branched from the base.
HEIGHT	6"-2½' high.	4"-6' high.	2"-1' high.	8"-3' high.	2"-8" high.	4"-12" high.
BRANCHES	Stout, angled, grayish when young.	Slender or stout, ascending, a little angled, nearly glabrous.	Slender or stout, more or less obtusely angled, coarsely scurfy to glabrate.	Rigid, brittle, terete or obscurely angled, coarsely white-scurfy, early turning red.	Numerous, stout, brittle, horizontally spreading, white-scurfy, faintly red.	Stout or slender, not angled, glabrate in age.
LEAVES	Alternate, except lower, sessile or subsessile, or lower petioled, lanceolate, ovate or deltoid, 2-5 cm. long, 1-4 cm. wide, cuneate or occasionally subhastate at base, obtuse or slightly acute at apex, entire or repand-dentate, grayish. (See illustrations under subspecies, page 8)	Alternate, except the lower, sessile or petioled, narrowly ovate to lanceolate, cuneate or rounded at the base, acute at apex, mucronulate, 2-6 cm. long, 1-3 cm. wide, coarsely toothed, gray-scurfy, cartilaginous on drying.	Alternate except a few basal pairs, sessile or short-petioled, elliptic, spatulate, oblanceolate or oblong, narrowed to the base, obtuse or acute at apex, 0.5-2.5 cm. long, 0.2-0.7 cm. wide, entire, scurfy, thin. (See illustrations under subspecies, page 8)	Alternate except 2 or 3 lower pairs, sessile or subsessile, ovate to lanceolate, rounded to the base, acute or acuminate at apex, 1-2 cm. long, 0.4-0.8 cm. wide, entire, thin, but firm, gray-scurfy, 1-nerved or 2faint nerves. 	Vary from opposite to mainly alternate, numerous, upper imbricate, closely sessile, ovate, lower lanceolate, rounded to the base, acute at apex, 0.4-1 cm. long, 0.3-0.5 cm. wide, entire, rigid, gray-scurfy, nerved.	Alternate except the lower, all but upper petioled, mostly approaching elliptic, nearly all broadest below middle, upper ovate, acute at apex, 0.5-2.5 cm. long, 0.3-1 cm. wide, entire, thin, gray-scurfy.
BRACTS	Sessile or subsessile, more or less compressed, united to the middle or cuneate-orbicular, 4-8 mm. long, 4-10 mm. wide, including the green foliaceous margins, which are subentire to variously laciniate, the faces smooth or appendaged or crested.	Sessile, compressed, united usually to the middle, rhombic or ovate from a broad base, 4-6 mm. long, of about the same width, occasionally up to 8 mm. long, becoming firm and indurated in age, wide, greenish; acutely dentate margins, the sides usually sharply tuberculate, 3-nerved. 	Short-pedicellate, strongly compressed, united throughout, (except herbaceous margins), orbicular, 2-4 mm. in diameter, margins minutely dentate all around.	Sessile, lightly compressed, united nearly to summit, ovate or somewhat narrowed at the base and then rhomboid and broadest at middle, 2.5-3.5 mm. long, 2.2-3 mm. broad, the thin margins few- to many-toothed or only erose, the apex usually ending in a prominent ovate tooth, the faces neither tubercled or appendaged, but gray-scurfy. 	Sessile, slightly compressed, united to a little above the middle, ovate or rhomboidal, often subhastately lobed, acute, 2.5-3.5 mm. long, 2.5-3 mm. broad, narrowly margined, entire, or with a prominent tooth on each side, the faces smooth to muricate. 	Sessile, compressed, united to above middle, broadly obovate or flabelliform, 3-4 or rarely 5 mm. broad, green foliaceous margins irregularly dentate or laciniate, the faces smooth (except for scurf) to cristate with numerous long appendages. 
SEEDS	1.5-2 mm. long, brown.	2-2.5 mm. long, dark brown, dull.	1-1.5 mm. long, pale to dark brown.	1-1.2 mm. long, dark brown, shining.	1-2 mm. long, dark brown or nearly black.	1-1.5 mm. long, dark purplish brown or burnt amber, shining.
DISTRIBUTION	Western North America.	Introduced.	Southern California to Lower California and Arizona.	Alkaline plains, southern part of San Joaquin Valley, California.	California: upper Sacramento Valley nearly to southern border, E. to edges of Mohave and Colorado deserts.	Interior of California, lower Sacramento Valley to Riverside Co.

CHART DESCRIPTIONS OF ATRIPLEX SPECIES (CONT.)

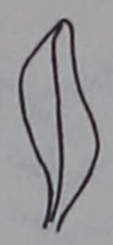
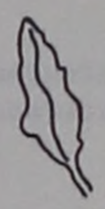
	13. A. californica	14. A. coulteri	15. A.leucophylla	16. A. decumbens	17. A. semibaccata
HABIT	Prostrate, perennial herb, forms tangled mats.	Spreading, perennial herb, branched from the base.	Prostrate, perennial herb with ascending leafy shoots, sometimes mat-like.	Prostrate, perennial herb, slightly woody below, forms tangled mats.	Prostrate, perennial herb, woody at base.
HEIGHT	Mats 4"-8" deep, 3' across.	4"-12" high.	4"-12" high.	Several meters across, 12"-16" deep.	Trailing stems to 4'.
BRANCHES	Erect, wiry, not angled, white, mealy, glabrate.	Slender, terete, not grooved or striate, glabrate, occasionally reddish.	Stout, obtusely angled when old, often pink, coarsely white-mealy.	Tough and flexuous, terete, densely white-scurfy.	Wiry, not angled, at first mealy, then glabrate.
LEAVES	Alternate, or lower opposite, crowded, sessile, lanceolate, or ovate-lanceolate, narrowed at base, acute at apex, 0.8-2 or rarely 3 cm. long, 0.2-0.4 wide, entire, gray tomentose, obscurely 1-nerved.	All alternate, on short petioles, or upper ones sessile, narrowly elliptic, narrowly oblong or lanceolate, tapering at base, acute at apex, 1-2 cm. long, 0.2-4 cm. wide, entire, thin, gray, with face scurfy or slightly greenish above, soft, 1-nerved.	Alternate except a few basal pairs, sessile or short-petioled, elliptic, spatulate, oblanceolate or oblong, narrowed to the base, obtuse or acute at apex, 0.5-2.5 cm. long, 0.2-0.7 cm. wide, entire, scurfy, thin. 	Numerous, nearly all opposite, sessile, broadly elliptic to ovate, narrowly rounded to the base, acute apex, 0.8-2 cm. long, 0.4-1 cm. wide, entire, thick, somewhat succulent when fresh, densely scurfy, 1-nerved.	Alternate, numerous, short-petioled, elliptic to elliptic-oblong, acute, or obtuse apex, 1.5-3 or 4 cm. long, 0.3-1.2 cm. wide, irregular and remotely repand-dentate, many entire, thin, gray-scurfy or greenish, 1-nerved. 
BRACTS	Sessile, compressed, separate nearly at base, ovate, acute, 3-5 mm. long, 2.5-4 mm. broad, entire, faces not appendaged, 1-nerved, under dense scurf.	Sessile or subsessile, moderately compressed, united to the middle, obovate, but with narrowed summit, 2.5-3 mm. long and about as broad, sharply dentate from the middle upwards, the sides with 3 prominent raised nerves or these obscure, also with cross veinlets and a few sharp tubercles or these wanting.	Sessile, spongy, not compressed, completely united except at apex, elliptic-globose, acutish, 5-7 mm. long, 4-5 mm. broad, entire or dentate, the faces at least lumpy and commonly with 2 or several wart-like projections, not nerved.	Sessile, not spongy, united to middle, ovate or rhombic, 5-8 mm. long, 5-6 mm. broad, with broad free margins above the middle, entire or erosely denticulate, side neither appendaged nor nerved.	Sessile or stalked, convex and fleshy, nearly flat when dry, rhombic, 3-6 mm. long, 3-5 mm. broad at middle, cuneate at base, acute at apex, united only below middle, margins denticulate or entire, sides 3-5 nerved, turning red.
SEEDS	2 mm. long, black.	1.3-1.5 mm. long, brown.	2.5-3 mm. long, dark reddish brown.	1 mm. long, light brown.	1.5 mm. long and black or 2 mm. long and brown, groove near margin.
DISTRIBUTION	Sandy coasts along Pacific Ocean, San Francisco to Cedros Island, Lower California.	Coast of southern California including islands.	Sea beaches of California and Lower California, casual inland at Lake Elsinore.	Santa Barbara Co. to San Quentin Bay, Lower California.	Introduced from Australia.

CHART DESCRIPTIONS OF ATRIPLEX SPECIES (CONT.)

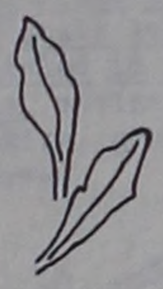
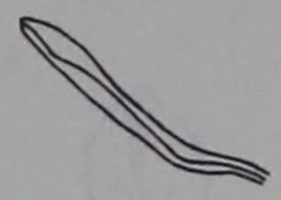
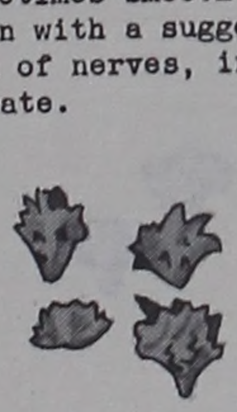
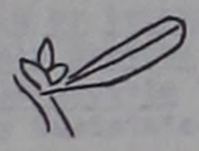
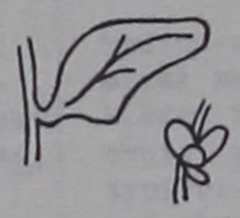
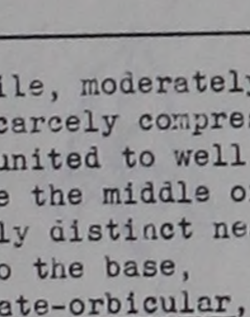
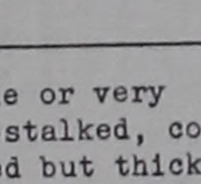
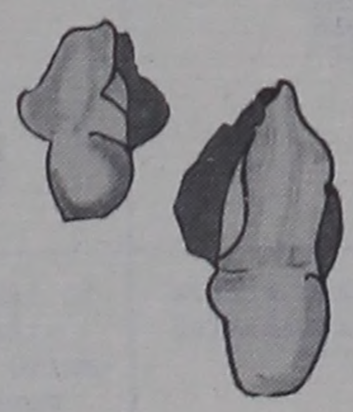
	18. A. halimoides	19. A. fruticulosa	20. A. hymenelytra	A. nuttallii 21. subsp. falcata	22. A. lentiformis
HABIT	Erect, spreading, or procumbent herb, perennial.	Spreading or nearly erect, perennial herb, from a woody base or rarely the stem also woody.	Erect, compactly branched, shrub.	Erect, or slightly spreading sub-shrub, woody at base.	Erect shrub, woody throughout, rigidly or flexuously branched.
HEIGHT	6"-16" high.	2"-12" high.	1'-3' high and broad.	8"-20" high.	3½'-10' high, spread 4"-16'.
BRANCHES	Brittle, not angled, white-mealy to glabrate.	Slender, terete, not grooved or striate, coarsely scurfy to glabrate and reddish.	Not striate, white-scurfy.	Erect or ascending, rigid, not angled, very white-scurfy.	Terete or sharply angled, gray-scurfy at first, soon smooth and pale.
LEAVES	Alternate, crowded, petioled, oblanceolate to rhomboid, narrow base, acute apex, 1-3 cm. long, 0.3-1.5 cm. wide, remotely repand-dentate or some entire, densely scurfy or greenish, 1-nerved. 	All alternate, mostly short-petioled, upper sessile, narrowly elliptic or linear-lanceolate, acute at each end, 0.5-1.5 cm. long, 0.2 to 0.4 cm. wide, entire, moderately thick, not succulent, gray on both faces, densely scurfy, soft, 1-nerved.	Numerous, persistent, alternate, on petioles 5-10 mm. long, orbicular or round-ovate, truncate, subcordate or short-cuneate at base, obtuse at apex, the blade 1.5-3 cm. long, and about as wide, deeply and irregularly dentate, with salient teeth, thick, silvery-scurfy, 1-nerved.	Alternate, except lower, short-petioled, linear-spatulate or rarely oblong-spatulate, more or less falcate, 2-4 cm. long, 0.2-0.7 cm. wide. 	Numerous, deciduous in the desert forms, and branchlets then spiny, alternate, petioled or the upper sessile, deltoid or rhombic to ovate or oblong, truncate to cuneate at base, obtuse and short mucronate at apex, 1-5 cm. long, 0.5-5 cm. wide, entire or subhastate, thin, gray- or bluish-scurfy. (See illustrations under subspecies, page 9.)
BRACTS	Sessile, not compressed, loose and spongy, turbinate or hemispheric, with much flattened summit, 6-12 mm. wide, united except at minutely valve-like tips, spersely scurfy.	Sessile or subsessile, not compressed or only slightly flattened, united to above the middle, orbicular, ovate, or subglobose, 3-4 mm. long and nearly as broad, narrowly margined and acutely dentate from the middle upwards, the sides neither strongly nerved nor reticulated, tooth-crested or muricate or sometimes smooth and then with a suggestion of nerves, indurate. 	Borne on short fusiform stalk, strongly compressed, except for small convex body, distinct or nearly so, orbicular or round-reniform, 6-12 mm. long and about as broad, the margins entire, the faces smooth but reticulate-veiny.	Lanceolate, or narrowly ovate, forming a fusiform fruit, sometimes long-stalked, often sessile, 4-6 mm. long, free tips elongated and beak-like, the sides with few to numerous conspicuous sharp appendages, these slightly or not at all flattened or the sides smooth.	Sessile, moderately compressed, united only near the base or up to the middle, orbicular or slightly broader than long or rarely elliptic, 2-5 or 7 mm. long and broad, the free margins entire or crenulate, the faces smooth.
SEEDS	1.5 mm. long, dark reddish brown or small and black.	1.5-1.7 mm. long, dark brown.	2 mm. long, brown.	1.5-2 mm. long, brown.	1.2-1.5 mm. long, brown.
DISTRIBUTION	Incompletely naturalized in southern California from Australia.	Sacramento and San Joaquin Valleys, California.	Alkali deserts of southeastern California, southern Nevada and southwestern Utah, south across western Arizona to Sonora and Lower California.	Northern part of Great Basin, in northeastern California.	Southern half of California to Nevada, southwestern Utah, New Mexico, Sonora, and border of Lower California.

CHART DESCRIPTIONS OF ATRIPLEX SPECIES (CONT.)

	23. A. polycarpa	24. A. parryi	25. A. spinifera	26. A. confertifolia	27. A. canescens
HABIT	Erect shrub, woody throughout, intricately much branched to form twiggy and usually rounded plant.	Erect shrub, woody throughout, rigidly branched, spiny.	Erect shrubs, very woody throughout, rigidly branched, spiny.	Erect shrub, woody throughout, rigidly branched, spiny.	Erect shrub, woody throughout, loosely to densely branched.
HEIGHT	3'-6' high.	8"-16" high.	12"-20" high.	8"-3' high.	8"-8' high.
BRANCHES	Not angled at first, gray-scurfy, later smooth.	Not angled, slender, erect or ascending, white-scurfy to glabrate.	Not angled but sometimes striate, stout, mostly erect, white-scurfy at first, glabrate.	Not angled, stout, erect or ascending, sparsely scurfy at first.	Terete, stout, gray-scurfy, glabrate and pale.
LEAVES	Crowded on young twigs, early deciduous, alternate, usually sessile, elliptic-oblong or spatulate, narrowed at base, acutish or obtuse at apex, usually 0.3-1.5 cm. long and 0.2-0.4 cm. wide, but up to 2.5 cm. long on sterile twigs often with very small leaves fascicled in the axils, entire, thickish, gray-scurfy, 1-nerved. 	At first crowded, deciduous from twigs, which are then transformed into spines, alternate, sessile, orbicular-ovate or subreniform, cordate or subcordate at base, obtuse at apex or those of inflorescence acute, 0.5-1.2 cm. long, 0.7-1.5 cm. wide, entire, thin, gray-scurfy, 1-3-nerved from base.	Crowded or sparse, deciduous from the twigs which then become spines, alternate, short-petioled, upper sessile, deltoid, ovate or elliptic, cuneate at base or truncate, obtuse at apex, 1-2 cm. long, 0.5-1 cm. wide, entire or those on sterile shoots subhastate, 1-nerved. 	Crowded, deciduous, twigs becoming spiny, alternate, short-petioled, orbicular-ovate, orbicular-obovate, or elliptic. rounded or cuneate at base, obtuse at apex, 1-2 cm. long, 0.5-1.2 cm. wide, entire, firm but not thick, gray-scurfy, 1-3-nerved.	Numerous, alternate, sessile or subsessile, linear to spatulate-oblong or broadly elliptic, narrowed at the base, usually obtuse at apex, 1-5 cm. long, 0.1-1 cm. wide, entire, thick, gray-scurfy, 1-nerved. (See illustrations under subspecies, page 9.)
BRACTS	Sessile, moderately or scarcely compressed, united to well above the middle or rarely distinct nearly to the base, cuneate-orbicular, 2-4 mm. long or up to 6 mm. when the teeth are well developed, as broad or broader, the thin margins shallowly to deeply and laciniately dentate above the base, the faces copiously cristate-appendaged to tuberculate or smooth. 	Sessile or very short-stalked, compressed but thick and rigid, united to above the middle and sometimes to the broad summit, forming a compressed-campanulate sac, bordered above by the thick margins, truncate-flabelliform when pressed, 3-4 mm. long, 3.5-4.5 mm. broad, entire, the face smooth. 	Closely sessile and adjacent pairs often fused at base, body globoid or slightly longer than broad (4-6 mm. thick), the free margins developed above the body into orbicular or oblong wings, the whole bract 7-15 mm. long, 3.5-10 mm. broad, entire or the wings irregularly dentate, the faces either smooth or with a few cristate appendages. 	Sessile, convex and united over seed, otherwise flat and free, nearly orbicular or broadly elliptic, 6-12 mm. long, 5-10 mm. broad, entire, the faces smooth.	Sessile or stalked, body not compressed, firmly united to the summit of the body above which the tips project as flat wings, the whole bract 4-12 or rarely 20 mm. long, above as broad, the margin developed into a pair of flat, broad wings, and second pair of wings developed also from the medial line of each exposed face, the 4 wings thus formed entire to laciniate, the faces smooth or with small appendages between the wings.
SEEDS	1-1.5 mm. long, pale brown.	1-1.5 mm. long, brown or amber.	2-2.8 mm. long, reddish brown.	1.5-2 mm. long, reddish brown.	1.5-2.5 mm. long, brown.
DISTRIBUTION	Desert areas, southern Nevada, southern Utah, Arizona, and Sonora west across Lower California, north to San Joaquin and Owens Valley, California.	Mohave Desert, California to western Nevada.	California: westerly side of San Joaquin Valley to western part of the Mohave Desert.	Dry alkaline plains and slopes, Montana, North Dakota, Wyoming, Colorado, northern Arizona, eastern California, eastern Oregon, and southern Idaho.	Widely distributed in western North America.

KEY TO THE SUBSPECIES OF ATRIPLEX PATULA

A. Bracts with narrow toothed margins, the teeth sometimes very small and sparse.

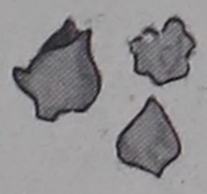
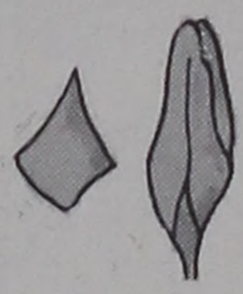
B. Leaf blades in part triangular-hastate or rhomboidal, with basal angles or lobes; bracts truncate or broadly rounded at base.....a. *hastata*

B'. Leaf blades lanceolate or oblong to linear, not hastate; bracts more often narrowly rounded or broadly cuneate at base.....b. *typica*

A'. Bracts with wider entire margins.

B. Bracts small, about 3 mm. long; leaves ovate-rhombic, coarsely toothed.....c. *spicata*

B'. Bracts larger, 4-12 or even 20 mm. long; leaves narrower, entire or shallowly toothed.....d. *obtusa*

	a. *hastata*	b. *typica*	c. *spicata*	d. *obtusa*
HABIT	Usually erect and the branches ascending, lower sometimes decumbent up to 6" high.	Usually erect, branches ascending or widely spreading.	Erect, not tall, the branches rigidly ascending.	Usually erect with widely spreading upcurved branches.
LEAVES	Large, petioled; blade deltoid or triangular, commonly hastate at base, sinuate-dentate to entire, rarely laciniate-dentate.	Medium-sized, petioled, blade lanceolate or oblong, rounded or narrowed to the base, not hastate, entire or denticulate, rarely with a pair of basal lobes.	Medium-sized, petioled, upper nearly sessile, blades triangular to ovate, usually rhombic, typically broad at base but shortly narrowed to the petiole, coarsely and irregularly sinuate-dentate.	Long and narrow, short-petioled, blade lanceolate to linear, attenuate to the base, (lower obtuse at apex), entire or crenulate, occasionally with 1 or 2 short ascending lobes from below the middle.
BRACTS	Ovate or triangular, 3-7 mm. long, broadly rounded or truncate at base, margins usually with a few toothlike projections, rarely more deeply dentate, the face commonly tuberculate. 	Rhomboid or roundish, 3-6 mm. long or up to 8 mm., narrowed to the base, the margins sparsely denticulate but the teeth sometimes obscure, rarely entire, the face commonly smooth.	Ovate-oblong, about 3 mm. long, the margins entire, the face not appendaged but strongly ribbed or furrowed.	Broadly ovate or rhomboidal, 4-12 mm. long, rounded to the base, the margins entire, the face smooth or rarely with a few appendages. 
DISTRIBUTION	Abundant in suitable places throughout the United States.	Newfoundland, to Gulf of Mexico, Southern California and British Columbia. Common in United States.	Middle western California.	Pacific coast from northern Alaska to middle California.

KEY TO THE SUBSPECIES OF ATRIPLEX ARGENTEA

A. Upper leaves short-petioled or subsessile.....a. typica

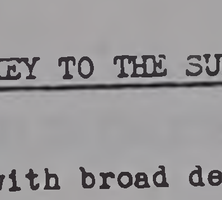
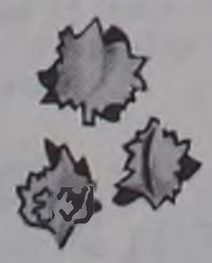
A'. Upper leaves closely sessile.....b. expansa

	a. typica	b. expansa
LEAVES	Leaves all more or less petioled, the petiole from nearly as long as the blade on lower leaves to almost obsolete on upper ones. Blades triangular-ovate or round-ovate, often subhastate.	Lower leaves on petioles sometimes as long as the blades, the middle and upper leaves closely sessile, commonly erect or incurved through the axils; blade broadly cordate-ovate to lance-ovate, often subhastate but the lower tapering to a petiole.
BRACTS		
DISTRIBUTION	Moderately alkaline soil, in California, in northeastern part.	Alkaline and fallow soil, New Mexico to Arizona and California, western Texas.

KEY TO THE SUBSPECIES OF ATRIPLEX ELEGANS

A. Fruiting bracts with broad deeply dentate margins; leaves often dentate...a. typica

A'. Fruiting bracts with very narrow shallowly dentate margins; leaves entire.b. fasciculata

	a. typica	b. fasciculata
HABIT	Plant usually 6"-2' high.	Plant commonly small, 2"-1' high, rarely more.
LEAVES	Elongated 1-2.5 cm. long, entire to saliently denticulate. 	.5-2 cm. long, entire.
BRACTS	With a broad, herbaceous border, which is sharply toothed or laciniate, the teeth 1 mm. long when well developed. 	With a narrow herbaceous border, which is minutely toothed or nearly entire.
DISTRIBUTION	Western Texas to southern Arizona, eastern border of California, Sonora, and Chihuahua.	Southern California from central Inyo Co. south across the Mohave and Colorado deserts to the borders of Lower California and western Arizona.

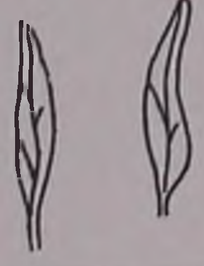
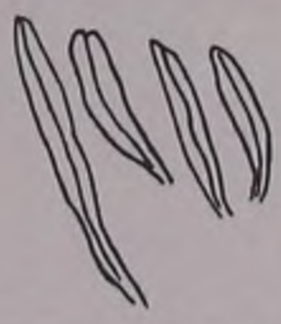
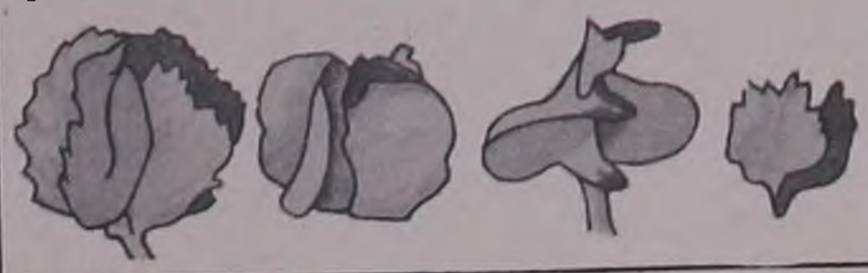
KEY TO THE SUBSPECIES OF ATRIPLEX LENTIFORMIS

A. Twigs not sharply angled.
  B. Mature bracts mostly crenulate on the margins, 2.5-4 or rarely 5 mm. broad; leaves mostly 1-2.5 cm. wide; interior.....a. *typica*
  B'. Mature bracts mostly entire, 3.5-5 or rarely 7 mm. broad; leaves mostly 1.5-5 cm. wide; coastal...b. *breweri*
A'. Twigs sharply angled by several raised rib-like longitudinal striae.....c. *torreyi*

	a. *typica*	b. *breweri*	c. *torreyi*
BRANCHES	Branches and twigs terete or with only obtuse and irregular angles, often rigid, rarely becoming spiny.	Branches and twigs terete or with only obtuse and irregular angles, not becoming spiny.	Branches and twigs acutely angled by prominent striae becoming somewhat spiny as leaves and bracts are lost.
LEAVES	Blades usually 2-4 cm. long, 1-2.5 cm. wide.	Blades 3-5 cm. long, 1.5-5 cm. wide.	Blades 1.5-3 cm. long, 0.5-2 cm. wide.
BRACTS	Flattish, or only slightly convex, mostly 2.5-4 mm. wide or up to 5 mm. and spongy, thickened when borne with male flowers, the margins crenulate, rarely entire.	Flattish, or convex, mostly 3.5-5 mm. in diameter or up to 7 mm., when borne in male inflorescence commonly thicker than in other forms, the margins usually entire or obscurely crenulate.	Flattish or somewhat convex, 2-4 mm. in diameter, the margins minutely crenulate.
DISTRIBUTION	Salinas and San Joaquin Valleys, California, to southwestern Utah, south in interior to Lower California and Sonora.	Coast of California, from Suisun, San Francisco Bay to Orange Co.	Principally in Nevada, extending southwest to the Mohave Desert and east to southwestern Utah.

KEY TO THE SUBSPECIES OF ATRIPLEX CANESCENS

A. Leaves linear to oblong or wider, 2 mm. or more wide; fruiting bracts 6-15 mm. or more long, or if shorter the leaves then 4 mm. or more wide.....a. *typica*
A'. Leaves linear, mostly 2 mm. or less wide; fruiting bracts 4-8 or rarely 10 mm. long.....b. *linearis*

	a. *typica*	b. *linearis*
HABIT	Shrub 16"-5' high.	Shrub 16"-6' or 8' high.
LEAVES	Linear-spatulate or narrowly oblong, mostly widest above the middle, obtuse or barely acute at apex, 1.5-4 or rarely 5 cm. long, .2-.8 cm. wide. 	Nearly linear, tending to widest above the middle, acute or obtuse at apex, 1-3 or rarely 5 cm. long, 2 mm. or less wide. 
BRACTS	6-15 or rarely 20 mm. long on straight or recurved stalks 2-15 mm. long, wings 4-8, rarely 12 mm. wide (reduced in some forms), usually much exceeding the triangular free terminal portion of the bracts. 	4-8 mm. long on short stalks less than 2 mm. long or sessile; wings 1-4 mm. wide, usually exceeded by the lanceolate free terminal portion of the bracts but this feature variable.
DISTRIBUTION	South Dakota to Kansas, western Texas to Lower California, eastern Washington and Idaho.	Arizona to Sonora, Lower California, and Colorado Desert of Alta California.